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Peter A. Valberg, Ph.D.
Principal

Areas of Expertise

Public health, inhalation toxicology, epidemiology, human health risk assessment, indoor / outdoor air quality, comparative toxicology, modeling of human exposure and retained dose, health effects of ionizing and non-ionizing radiation, biophysics of power-line fields and cell telephone radio waves, risk communication.

Education

M.S., Human Physiology and Inhalation Toxicology, Harvard University, School of Public Health.

Ph.D., Physics, Harvard University, Graduate School of Arts and Sciences.

M.A., Physics, Harvard University.

A.B., Physics and Mathematics, *summa cum laude*, Taylor University.

Professional Experience

1990 – 1998 GRADIENT CORPORATION, Cambridge, MA

2001 – Present Principal and Senior Scientist in inhalation toxicology; environmental health; human health risk assessment; use of epidemiology in public health decisions; health effects of airborne gases and particles; health effects of ionizing and non-ionizing radiation.

1985 – 2000 HARVARD SCHOOL OF PUBLIC HEALTH, Boston, MA

Associate Professor of Human Physiology. (Adjunct, after 1990) Research areas: (1) human health effects of air toxics, (2) lung macrophage function measured with magnetic particles, (3) lung deposition and clearance of radioactive tracer particles.

1998 – 2000 CAMBRIDGE ENVIRONMENTAL, INC., Cambridge, MA

Senior Scientist

1989 INSTITUTE OF OCCUPATIONAL HEALTH, Helsinki, Finland

Visiting Researcher. Developed a magnetometric assay to be used for studying pulmonary macrophage function for lung cells lavaged from human subjects.

1982 INHALATION TOXICOLOGY RESEARCH INSTITUTE, Albuquerque, NM

Visiting Scientist. Examined the effect of exercise and hypercapnia on deposition, lung clearance, and lung distribution of inhaled radioactive aerosol.

1976 – 1985 HARVARD SCHOOL OF PUBLIC HEALTH, Boston, MA

Assistant Professor of Respiratory Physiology.

1970 - 1976 AMHERST COLLEGE, Amherst, MA

Assistant Professor of Physics.

Professional Activities

- Physical and Biological Sciences Study Committee, Town of Needham Planning Board
- National Academy of Sciences and National Research Council, Evaluating Health-Risk-Reduction Benefits of USEPA Regulations (2001 – 2003)
- Harvard School of Public Health: Research Advisory Committee Member for NIH-Sponsored Research on "Mechanisms of mortality/morbidity due to air particulate" (1997 – present)
- Member of the Committee on Man and Radiation (COMAR) (1999 – present)
- Health Effects Institute, Cambridge, MA, *ad hoc* reviewer (1984 – 94)
- National Research Council, Commission on Life Sciences: Committee on Passive Smoking (1986-88)
- Editorial Board, *Journal of Aerosol Medicine* (1987- 2000)
- Center for Indoor Air Research, grant-application reviewer (1989 – present)
- NIOSH: Environmental Center Grants, Site Visit Delegation (1990)
- NIH: Cardiovascular and Pulmonary Study Section, and Radiation Study Section, reviewer
- DOE: Office of Health and Environmental Research, reviewer
- Harvard Center for Risk Analysis: Peer Review Board on Cellular Telephones (1994 – 1999)

Professional Affiliations

International Society for Environmental Epidemiology • Society for Risk Analysis • Health Physics Society • International Society for Aerosols in Medicine • Sigma Xi • American Association for the Advancement of Science

Projects (*abbreviated*)

Mining Company: Evaluated the scientific and epidemiological basis for the toxicity of arsenic in soils. Evaluated metals toxicity factors and site-specific bioavailability of metals. Recalculated the cancer potency factor for arsenic, using the original cancer prevalence data in combination with a modified water intake.

Utility: Analyzed the relationship between inhaled carbon monoxide concentration and blood carboxyhemoglobin. Performed sensitivity analysis on all the variables involved.

Waste Management Company: Evaluated health risks for a medical waste incinerator, including emissions estimates, exposure modeling, and multiple-pathway (ingestion, inhalation, dermal, mothers' milk) health risk assessment.

Confidential Client: Prepared a risk assessment for a Massachusetts landfill containing both chemical and radioactive waste. Multiple pathways of contaminant uptake were assessed for a potential trespasser scenario.

Confidential Client: Prepared a model predictive of asbestos fiber drift and inhalation health hazard applicable to various industrial processes where asbestos-containing materials are used.

Confidential Client: Prepared an analysis of relative risks of TCE in drinking water *versus* health hazards from background levels of chemicals in air, water, and soil, as well as other routine risks to life and health.

Confidential Clients: Prepared human toxicology profiles for a range of chemical substances, including beryllium, carbon black, chlorine, coke oven emissions, copper, ferrocene, Freon, manganese, *n*-butylamine, and thorium.

Electric Power Research Institute: Reviewed and analyzed the various possible mechanisms by which biological systems may be affected by environmental electric and magnetic fields (EMFs). Organized a leukemia workshop.

Engine Manufacturers Association: Prepared critiques of the U.S. EPA and California EPA health assessment documents on the potential carcinogenicity of diesel exhaust particles and ambient air particulate matter.

Environmental Health Association for the Carbon Black Industry: Evaluated the toxicology and epidemiology of carbon black (CB) inhalation and ingestion. Reviewed IARC document on the carcinogenicity of CB.

Harvard School of Public Health: Continuing Education for Professionals: Prepared material on special topics on inhalation toxicology for graduate students and health professionals: Presented lectures on risk assessment and risk communication. Presented case studies on health risks of electric and magnetic fields and cellular telephones.

Health Effects Institute: Prepared a state-of-the-art document on inhaled ozone dosimetry: "Ozone Molecular Dosimetry and Interaction with Biological Macromolecules." Reviewed *in vivo* and *in vitro* O₃ uptake and mechanisms of toxicity..

Health Effects Institute: Organized, supervised, and documented a feasibility study for the Health Effects Institute initiating a national research program on the health effects of electric and magnetic fields.

California Manufacturing Company: Prepared a multi-pathway human health risk assessment for a site contaminated with polychlorinated biphenyls (PCBs) and chlorinated organic solvents (PCE, TCE, DCE, VC). Analyzed experimental data to derive a fraction of PCBs that are picked up from contaminated surfaces by dermal contact.

Refinery: Prepared a multipathway human health risk assessment for air emissions from a petroleum refinery. Our risk assessment preparation process was monitored by a Task Force composed of regulators, educators, union members, and local officials.

Utility: Prepared an in-depth critique of the risk assessment prepared for a coal-fired power plant. Risk assessment included multi-pathway exposure plus evaluation of both normal and upset operating considerations. Dioxins and metals were most important chemicals.

Massachusetts Department of Public Health: Prepared a public communications essays on what citizens can do to support improved air quality.

Michigan Occupational and Environmental Medical Association (MOEMA): Prepared and delivered a tutorial on risk assessment methodologies for MOEMA's Continuing Education program.

National Institute of Environmental Health Sciences -- Division of Research Grants: Participated in the Radiation Study Section Peer-Review Panel of grant applications in response to a RFA on EMF Health-Effects Research.

Navy Occupational Health and Preventive Medicine Program: Prepared and delivered seminars and workshops to U.S. Navy medical personnel on the current research on the health effects of electric and magnetic fields (EMFs).

Newton Health Department: Measured RF levels from a local transmitting antenna, reviewed RF field calculations, and provided scientific literature critique on RF health effects.

A Renewable Fuels, Electric Generating Company: Prepared and delivered public testimony on the potential health effects of airborne emissions from a wood-fired electric power generating plant.

U.S. Department of Energy: Prepared a risk communication strategy for a nuclear test site where detonation of underground atomic devices had the potential to contaminate groundwater with radioisotopes (primarily tritium); the groundwater had the potential to reach off-site farms and ranches at some time in the future.

U.S. Department of Justice: Prepared an analysis of the health hazards of the Love Canal Superfund site (Niagara Falls, NY) as they were known at the time of the emergency declarations in 1978 and in 1981.

U.S. Department of Justice: Prepared a report and provided expert testimony on human toxicology with regard to soil contamination at a RCRA site.

U.S. Department of Justice: Prepared reports and provided expert testimony on asbestos, sulfuric acid, and airborne particulate inhalation toxicology.

U.S. Environmental Protection Agency: Analyzed the health risks of a remediation alternative at the Bloody Run Creek section of the Hyde Park Landfill superfund site (Niagara Falls, NY).

U.S. Environmental Protection Agency, Health Effects Research Laboratory: Helped EPA prepare a database of non-cancer health effects for 189 Hazardous Air Pollutants designated in the 1990 Clean Air Act Amendments.

U.S. Environmental Protection Agency, Environmental Criteria and Assessment Office: Participated in peer review group that evaluated research proposals on "Indoor and Ambient Air Risk Assessment Methodologies."

University of Denver: Analyzed the potential health impact of uranium disposal from munitions testing ("depleted uranium") as it was practiced in the 1960's and 1970's.

Western Uranium Mill: Evaluated the implications of radioactive substance migration as predicted by different EPA and DOE models. Assessed the health impact of radioisotopes, and uptake of radioactivity into food.

World Health Organization: Helped prepare a WHO research report on electric and magnetic field health effects.

Academic Research Projects (*abbreviated*)

National Heart, Lung, and Blood Inst.:	"Physical Determinants of Lung Function and Dysfunction."
National Heart, Lung, and Blood Inst.:	"Pulmonary SCOR: Chronic Diseases of the Airways."
National Cancer Institute:	"Magnetic Field Effects on Macrophages."
National Inst. of Environ. Health Sci.:	"Inhaled Particle Retention in Normal and Diseased Lungs."
National Heart, Lung, and Blood Inst.:	"Particle Location and Ingestion by Lung Macrophages."
National Inst. of Environ. Health Sci.:	"Factors Influencing Deposition of Inhaled Aerosols."

Publications – Articles

Valberg, P.A. 2004. Is PM more toxic than the sum of its parts? Risk-assessment toxicity factors versus PM-mortality "effect functions." *Inhalation Toxicology* 16(Supplement 1):19-29.

Valberg, P.A. 2003. Possible non-causal bases for correlations between low concentrations of ambient particulate matter (PM) and daily mortality. *Non-Linearity in Biology, Toxicology, and Medicine* 1:521-530.

Valberg, P.A. 2003. Ambient particulates and health effects. In *A Practical Approach to Occupational and Environmental Medicine* (Ed: Robert J. McCunney), Lippincott Williams & Wilkins, Philadelphia, pp. 835-850.

Brain, J.D., R. Kavet, D.L. McCormick, C. Poole, L.B. Silverman, T.J. Smith, P.A. Valberg, R.A. Van Etten, and J.C. Weaver. 2003. Childhood leukemia: Electric and magnetic fields (EMF) as possible risk factors. *Environmental Health Perspectives* 111:962-970.

Multi-author Report. 2002. Estimating the Public Health Benefits of Proposed Air Pollution Regulations. NAS Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations, Board on Environmental Studies and Toxicology, National Research Council. *The National Academies Press*, 192 pp.

Bunn III, W.B., P.A. Valberg, T.J. Slavin, and C.A. Lapin. 2002. What is New in Diesel. *International Archives of Occupational Environmental Health* Jul:75(Supplement 1):122-132.

Ames, M.R., S.G. Zemba, R.J. Yamartino, and P.A. Valberg. 2002. Letter to the editor, Comments on: Using CALPUFF to evaluate the impacts of power plant emissions in Illinois: model sensitivity and implications. *Atmospheric Environment* 36:2263-2265.

McCunney R., H. Muranko, and P.A. Valberg. 2001. *Patty's Toxicology*, 5th Edition (Edited by E. Bingham) Volume 8, Chapter 111 - Carbon Black, John Wiley & Sons, New York.

Watson, A.Y. and P.A. Valberg. 2001. Carbon black and soot: Two different compounds. *American Industrial Hygiene Association Journal* 62:218-228.

Valberg, P.A. 2000. Comparison of endogenous forces in cells to RF- and EMF-produced forces. *Radiation Research, Volume 2: Proceedings of the 11th International Congress of Radiation Research*, (Moriarty, M., et al., Editors) International Association of Radiation Research. Allen Press, Lawrence, KS, 2000. pp. 219-221.

Valberg, P.A., and A.Y. Watson. 2000. Lack of concordance between reported lung-cancer risk levels and occupation-specific diesel-exhaust exposure. *Inhalation Toxicology* 12(Supplement 1):199-208.

Valberg, P.A., and E.A.C. Crouch. 1999. Meta analysis of rat lung tumors from lifetime inhalation of diesel exhaust. *Environmental Health Perspectives* 107:693-699.

Valberg, P.A., and A.Y. Watson. 1999. Comparative mutagenic dose of ambient diesel-engine exhaust. *Inhalation Toxicology* 11:215-228.

Armstrong, S. and P.A. Valberg. 1999. "EMF and MCS: Truth or Scare?" In: *Environmental Law and Policy* 3:#1 and 3:#2. Morrison, Mahoney & Miller, L.L.P. Boston, MA.

Valberg, P.A., B.D. Beck, P.D. Boardman, and J.T. Cohen. 1998. Likelihood ratio analysis of skin cancer prevalence associated with arsenic in drinking water in the USA *Environmental Geochemistry and Health* 20:61-66.

Slayton, T.M., P.A. Valberg, and A.D. Wait. 1998. Estimating dermal transfer from PCB-contaminated porous surfaces. *Chemosphere* 36:3003-3014.

Valberg, P.A., and A.Y. Watson. 1998. Alternative hypotheses for PM associations with daily mortality and morbidity. *Inhalation Toxicology* 10:641-662.

Guo, H.R., and P.A. Valberg. 1997. Evaluation of the validity of the U.S. EPA's cancer risk assessment of arsenic for low-level exposures: A likelihood ratio approach. *Environmental Geochemistry and Health* 19:133-141.

Valberg, P.A., B.D. Beck, T.S. Bowers, Janet L. Keating, P.D. Bergstrom, and P.D. Boardman. 1997. Issues in setting health-based cleanup levels for arsenic in soil. *Reg. Tox. Pharmacol.* 26:219-229.

Valberg, P.A., R. Kavet, and C.N. Rafferty. 1997. Can low-level 50/60-Hz electric and magnetic fields cause biological effects? *Radiation Research* 148:2-21.

Valberg, P.A. 1997. Radio-frequency radiation (RFR): The nature of exposure and carcinogenic potential. *Cancer Causes and Control* 8:323-332.

Slayton, T.M., B.D. Beck, R.A. Schoof, T.D. Gauthier, K.A. Reynolds, S.D. Chapnick, L. Jones, and P.A. Valberg. 1996. Issues in arsenic risk assessment. *Env. Health Perspec.* 104:1012-1014.

Sastre, A., A. Pilla, C. Polk, and P.A. Valberg. 1996. Induced currents, transient and otherwise: discussion and summary. In *Proceedings of Joint NIOSH/DOE Workshop: EMF Exposure Assessment and Epidemiology: Hypotheses, Metrics, and Measurements*. Cincinnati, Ohio, September 26-28, 1994 (Eds: J.D. Bowman, P.C. Gailey, L. Gillette, W.G. Lotz, and D. Overton), National Technical Information Service, Springfield, VA. NTIS Document No. PB 2000-101086, pp. 110-130. Located at: <http://www.cdc.gov/niosh/pdfs/doewkshp.pdf>.

Valberg, P.A., and A.Y. Watson. 1996. Analysis of diesel-exhaust unit-risk estimates derived from animal bioassays. *Regulatory Toxicology and Pharmacology* 24:30-44.

Watson, A.Y. and P.A. Valberg. 1996. Particle-induced tumors in rats: Evidence for species-specificity in mechanisms. *Inhalation Toxicology* 8: 227-257 (Supplement 1).

Valberg, P.A., and A.Y. Watson. 1996. Lung cancer rates in carbon-black workers are discordant with predictions from rat bioassay data. *Regulatory Toxicology and Pharmacology* 24: 155-170.

Drivas, P.J., P.A. Valberg, B.L. Murphy, and R. Wilson. 1996. Modeling indoor contaminant exposure from short-term point source releases. *Indoor Air* 6:271-277.

Valberg, P.A. (multi-author report). 1996. Harvard report on cancer prevention. Volume 1: Causes of human cancer. *Cancer Causes & Control* 7 (Supplement 1):S1-S59.

Valberg, P.A., P.J. Drivas, S. McCarthy, and A.Y. Watson. 1996. Evaluating the health impacts of incinerator emissions. *J. Hazardous Materials* 47:205-227.

Valberg, P.A. 1995. "Designing EMF experiments: What is required to characterize "Exposure"". *Bioelectromagnetics* 16:396-401, Reply to comments *Bioelectromagnetics* 16:406.

Slayton, T.M., P.A. Valberg, and C.B. Counihan. 1995. Risk communication for accidental release scenarios. *Air & Waste Management Association*. Paper # 95-WP95.02. 88th Annual Meeting, San Antonio, TX, June 19-23, 1995.

Slayton, T.M., B.D. Beck, and P.A. Valberg. 1995. Evaluation of health effects resulting from accidental exposures. *Air & Waste Management Association*. Paper # 95-RA112.02. 88th Annual Meeting, San Antonio, TX, June 19-23, 1995.

Bergstrom, P.D., H.L. Greene, R.A. Schoof, C.P. Boyce, L.J. Yost, B.D. Beck, and P.A. Valberg. 1994. The use of site-specific studies to assess arsenic health risks at a Superfund site. In: *Arsenic Exposure and Health* (W.R. Chappel, C.O. Abernathy, and C.R. Cothorn, eds.) Science and Technology Letters, Northwood. pp. 239-250.

Valberg, P.A. 1994. Biology and electric and magnetic fields: Biophysical mechanisms of interaction. *Electric Power Research Institute (EPRI) Report TR-104800*. Final Report on EPRI Research Project 2965-28, December, 1994. EPRI, 3412 Hillview Avenue, Palo Alto, CA.

Sweeney, T.D., P.A. Valberg, H.A. Feldman, S.B. Bloom, and J.D. Brain. 1994. Wheel-running exercise for 60 days does not alter either the rate of clearance of magnetite from hamster lungs or macrophage organelle motility. *Ann. Occup. Hyg.* 38:235-241 (Supplement 1).

Valberg, P.A., H. Reichel, N.B. Sundquist, and C.L. Bizal. 1994. Lung macrophage organelle motion slows after particle phagocytosis. *Ann. Occup. Hyg.* 38:411-417 (Supplement 1).

Valberg, P.A. 1993. Health impact of radioactivity in wood fuel. *Proceedings of the 5th Annual National Biofuels Conference*. (October, 1992, Boston, MA). pp. 373-380.

Valberg, P.A. 1993. Physiology of the lungs and their reaction to environmental chemicals. *Proceedings of the 34th Annual Marine Chemists Seminar*. (July, 1992, Boston, MA). pp. 7-16.

Valberg, P.A. 1993. A public health framework for addressing a layperson's perception of EMF health risk. *Electricity and Magnetism in Biology and Medicine*. (Martin Blank, Ed.) San Francisco Press. pp. 273-277.

Health Effects Institute (P.A. Valberg, contributing author). 1993. "Do electric or magnetic fields cause adverse health effects? HEI's research plan to narrow the uncertainties." The final report of HEI's EMF Planning Committee to the HEI Board of Directors. June, 1993, Cambridge, MA. pp. 1-131.

Reid, M.B., K.E. Haack, K.M. Franchek, P.A. Valberg, L. Kobzik, and M.S. West. 1992. Reactive oxygen in skeletal muscle: I. Intracellular oxidant kinetics and fatigue *in vitro*. *J. Applied Physiol.* 73:1797-1804.

Dorries, A.M., and P.A. Valberg. 1992. Heterogeneity of phagocytosis for inhaled *versus* instilled material. *Am. Rev. Respir. Disease* 146:831-837.

Valberg, P.A. and J.D. Blanchard. 1992. Pulmonary macrophage origin, endocytic function, and fate. Ch. 36 in *Comparative Biology of the Normal Lung*. (Ed: Richard A. Parent), CRC Press, Boca Raton, FL. pp. 681-724.

Drivas, P.J., P.A. Valberg, and T.D. Gauthier. 1991. Health assessment of air toxics emissions from alternative fuels. *84th Ann. Meeting of the Air and Waste Management Assoc.*, Vancouver, BC. Publication # 91.107.6, 15 pp.

Bizal, C.L., J.P. Butler, and P.A. Valberg. 1991. Viscoelastic and motile properties of hamster lung and peritoneal macrophages. *J. Leukocyte Biol.* 50: 240-251.

Bizal, C.L., J.P. Butler, H.A. Feldman, and P.A. Valberg. 1991. The kinetics of phagocytosis and phagosome-lysosome fusion in hamster lung and peritoneal macrophages. *J. Leukocyte Biol.* 50: 229-239.

Valberg, P.A. 1990. The respiratory tract as a portal of entry for toxic particles. In *Route-to-Route Extrapolation Modeling* (Eds: T.R. Gerrity and C.J. Henry), Elsevier Science Publishing, New York, pp. 61-70.

- Valberg, P.A. and J.P. Butler. 1990. Intracellular movement and intracellular viscosity. What can magnetic microparticles tell us? *Comments on Theoretical Biology* 2: 75-97.
- Valberg, P.A., W.A. Jensen, and R.M. Rose. 1990. Bronchoalveolar lavage macrophages from smokers and nonsmokers: cell organelle motions. *Am. Rev. Respir. Dis.* 141: 1272-1279.
- Zaner, K., and P.A. Valberg. 1989. F-actin viscoelasticity measured by magnetic microparticles. *J. Cell Biol.* 109: 2233-2243.
- Valberg, P.A. and J.D. Brain. 1988. Lung particle retention and lung macrophage function evaluated using magnetic aerosols: a review. *Journal of Aerosol Medicine: Deposition, Clearance, and Effects in the Lung*. 1(4):331-349.
- Brain, J.D., S.B. Bloom, and P.A. Valberg. 1988. Magnetometry -- a tool for studying the cell biology of macrophages. In *Biomagnetism '87*, (Eds: K. Atsumi, M. Kotani, S. Ueno, T. Katila, S.J. Williamson), Tokyo Denki Press, Tokyo, pp. 10-17.
- Brain, J.D., S.B. Bloom, T. Hu, P. Gehr, and P.A. Valberg. 1988. Magnetic iron dust as a probe of particle clearance, phagocytosis, and particle cytotoxicity in the lungs. *Ann. Occup. Hyg.* 32:783-793 (Supp. 1). (*Inhaled Particles VI*).
- Valberg, P.A. 1988. Lung macrophage function evaluated using magnetic aerosols. *Ann. Occup. Hyg.* 32:795-808 (Supp. 1). (*Inhaled Particles VI*).
- Valberg, P.A., B. Meyrick, J.D. Brain, and K.L. Brigham. 1988. Phagocytic and motile properties of endothelial cells from bovine pulmonary artery: effects of endotoxin. *Tissue & Cell* 20:345-354.
- Brain, J.D., P.A. Valberg, and G. Mensah. 1988. Species differences. In *Variations in Susceptibility to Toxic Agents in the Air* (Eds: J.D. Brain, J. Warren, B. Beck, R. Shaikh), John Hopkins University Press, Baltimore, pp. 89-103.
- Brain, J.D., S.B. Bloom, P.A. Valberg, and P. Gehr. 1987. Retention and diagnostic uses of magnetic aerosols. In *Deposition and Clearance of Aerosols in the Human Respiratory Tract* (Ed: W. Hofmann), Facultas Universitätsverlag Press, Wien, Austria, pp. 3-15.
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- Valberg, P.A., and H.A. Feldman. 1987. Magnetic particle motions within living cells: investigations of cytoplasmic viscosity and motile activity. *Biophysical Journal*. 52:551-561.
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- Valberg, P.A. 1985. Magnetic particles used as active and passive probes of intracellular properties of living cells. In *Biomagnetism Application and Theory: Proceedings of the 5th World Conference on Biomagnetism* (Eds: H. Weinberg, G. Stroink, T. Katila) Pergamon Press, Elmsford, NY, pp. 388-394.
- Valberg, P.A. 1984. Magnetometry of ingested particles in pulmonary macrophages. *Science* 224:513-516.
- Brain, J.D., P.A. Valberg, S.B. Bloom, P. Gehr, and B.D. Beck. 1984. Morphological, physiological, and magnetometric studies of inhaled iron oxide particles. *J. Aerosol Sci.* 15:227-229.
- Brain, J.D., S.B. Bloom, P.A. Valberg, and P. Gehr. 1984. Correlation between the behavior of magnetic iron oxide particles in the lungs of rabbits and phagocytosis. *Experimental Lung Research* 6:115-131.
- Gehr, P., J.D. Brain, S.B. Bloom, and P.A. Valberg. 1983. Magnetic particles in the liver: a probe for intracellular movement. *Nature* 302: 336-338.
- Valberg, P.A., B.H. Chen, and J.D. Brain. 1982. Endocytosis of colloidal gold by pulmonary macrophages. *Experimental Cell Research* 141:1-14.
- Valberg, P.A., J.D. Brain, S.L. Sneddon, and S.R. LeMott. 1982. Breathing patterns influence aerosol deposition sites in excised dog lungs. *J. Appl. Physiol.: Respir. Environ. Exercise Physiol.* 53(4):824-837.
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- Brain, J.D., and P.A. Valberg. 1979. State of the art: deposition of aerosols in the respiratory tract. *Am. Rev. Respir. Dis.* 120:1325-1373.
- Valberg, P.A. and J.D. Brain. 1979. Generation and use of three types of iron oxide aerosol. *Am. Rev. Respir. Dis.* 120:1013-1024.
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Brain, J.D., and P.A. Valberg. 1974. Models of lung retention based on the report of the ICRP Task Group. *Arch. Environ. Health* 28:1-11.

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Abstracts & Reports (list available on request)

Invited Lectures (past 8 years only)

- 1/27/04 "Quantitative and Qualitative Factors that Determine Health Risk: Explaining Risk to Judges, Juries, and Communities." *Mealey's Water Contamination Conference*, Pasadena, California.
- 9/14/02 "Health Effects of Air Pollutants." Annual Scientific Meeting of the Michigan Occupational and Environmental Medicine Association *Current Topics in Occupational and Environmental Medicine*, Frankenmuth, MI.
- 6/18/01 "Pulmonary Physiology, and Lung Deposition and Clearance of Particles." Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA
- 11/14/00 "Effects of Air Pollution on the Human Lung." Lecture in Tufts University course CEE 136, *Air Pollution*, Medford, MA
- 7/26/00 "Review of Ambient Air Quality as it Relates to Proposed Emission Standards for Massachusetts Power Plants." *Testimony before the Massachusetts Department of Environmental Protection*, Boston, MA.
- 1/10/00 "Useful Concepts in the Physics of RF." *RF Safety: Science, Compliance and Communication*, Electromagnetic Energy Association and the University of Texas Health Science Center, San Antonio, TX.
- 12/16/99 "Exposure to inhaled pesticides and human health risks." *51st Annual Crop Protection School*. Office of Continuing Professional Education, North Carolina State University, Raleigh, NC.
- 7/21/99 "How do Endogenous Forces Compare to EM Forces and Torques on Electrical Charges and Magnetite?" *11th International Congress of Radiation Research*, Dublin Inst. of Technology, Dublin, Ireland, July 18-23, 1999.
- 6/7/99 "Lack of Concordance between Reported Lung Cancer Risk Levels and the Occupation-Specific Potential for Diesel Exhaust Exposure." *Third Colloquium on Particulate Matter and Human Health*, Durham, North Carolina, June 6-8, 1999.
- 3/8/99 "Relative Risk Issues in Urban Pesticide Exposure and Children's Health." *Association of American Pesticide Control Officials*, AAPCO States/Industries Forum, Washington, DC.
- 1/13/99 "Panel Discussion on Health Effects of Wireless Technology." *Cape Cod Commission*, Deliberations at Cape Cod Community College, Barnstable, MA.
- 12/8/98 "Review of Health Issues in a Proposed Antenna Upgrade." *City of Newton Health Department*, Land Use Committee Deliberations, Newton, MA.

- 11/30/98 "Overview of radio wave health effects." Wayland, MA, Cellular Telephone Committee, Wayland Town Meeting Warrant.
- 8/3/98 "Exposure assessment in power-line-EMF and radio-wave epidemiologic studies." *EPE.215T Environmental and Occupational Epidemiology*, Harvard School of Public Health, Boston, MA.
- 4/22/98 "Health risks from electrical power lines and cellular telephones." *EH.202D Principles of Environmental Health*, Harvard School of Public Health, Boston, MA.
- 3/23/98 "Inhalation and Dermal Exposure to Occupational Chemicals." Harvard School of Public Health, Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.
- 3/1/98 "Practical Experiences with Risk Communication: What works and What Doesn't?" Society of Toxicology, 37th Annual Mtg., Continuing Education Course on *Risk Communication: Avoiding the Pitfalls*. Seattle, WA.
- 10/14/97 "Physics, Dosimetry, and Mechanisms of Interaction of EMF with Living Organisms." Harvard School of Public Health Continuing Education Course on *Electric and Magnetic Field Health Research: Assessing the Science*, Boston, MA.
- 10/6/97 "Pathways of Exposure for Occupational Chemicals." Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.
- 9/30/97 "Particulate Matter and the Proposed NAAQS." *Air Pollution CEE/CHE 193.L* course, Tufts University, Department of Public Safety, Somerville, MA.
- 9/23/97 "Principles of Toxicology." Harvard School of Public Health Continuing Professional Education Course: *Analyzing Risk: Science, Assessment, and Management*, Boston, MA.
- 10/7/96 "Issues in Inhalation Exposure in the Workplace." Harvard School of Public Health Continuing Professional Education Course: *Fundamentals of Industrial Hygiene*, Boston, MA.
- 7/22/96 "Magnetic Particles in Cells and Tissues: Characteristics of Their Interactions with Magnetic Fields." *Gordon Research Conference on Bioelectrochemistry*. Newport, RI.
- 5/2/96 "A Confounding Role for Indoor Air Pollutants in PM Associations with Daily Morbidity & Mortality." *Second Colloquium on Particulate Air Pollution*. Park City, UT.
- 3/27/96 "Pulmonary Deposition and Clearance of Particles." Harvard School of Public Health Continuing Education Course on *Fundamentals of Industrial Hygiene*, Boston, MA.

Manuscript Peer Reviewer for the Following Research Journals

American Industrial Hygiene Journal, American Journal of Physics, American Journal of Respiratory Cell and Molecular Biology, American Review of Respiratory Disease, Bioelectromagnetics, Biophysical Journal, Biorheology, Cell Biophysics, Environmental Geochemistry and Health, Environmental Health Perspectives, Epidemiology, Experimental Lung Research, Fundamental and Applied Toxicology, Hepatology, IEEE Biomedical Engineering, IEEE Transactions on Plasma Science, Journal of Aerosol Medicine, Journal of Applied Physiology, Journal of Applied Toxicology, Journal of Occupational and Environmental Medicine, Nature, Radiation Research, Risk Analysis: An International Journal, Regulatory Toxicology & Pharmacology, Science, Tissue & Cell, USGS Environmental Geochemistry of Mineral Deposits (Reviews in Economic Geology series).